

REMARKS

Summary

Claims 30-31, 33-43, 46-53, 78-80, 82, 102-103, and 105-140 are pending. Claim 101 has been cancelled. Claim 102 has been amended to include limitations related to crystallization of an amorphous material as originally recited in dependent claims 112 and 113, which are cancelled herein to avoid redundancy. Claim 33 has been amended herein as supported by the specification at least in paragraphs [0066] and [0102]. Claims 34-35 and 135 have been amended similarly, as supported in the specification at least in paragraphs [0069], [0070], [0100], and [0102]. Claims 46-47 and 114-115 are amended for consistency with the respective independent claims. Claims 105-107 are amended to correct typographical errors affecting proper antecedent basis.

Telephone Interview on April 9, 2007

Applicants gratefully acknowledge Examiner Trinh's time by phone on April 9, 2007, to discuss the rejections of claims 30, 113, and 132. Claims 33-35 were also discussed. During the telephone interview, Examiner Trinh stated that she would withdraw the finality of the March 9 Office action and enter Applicants' response. She also stated that she had discussed the case with a primary examiner, who agreed with Applicant's arguments that the cited references do not teach the limitations of claims 30, 113, and 132 related to crystallization of an amorphous material (e.g., claim 30 recites "wherein the annealing comprises crystallizing at least a portion of the amorphous material to a polycrystalline material"). Examiner Trinh asked that Applicants prepare a response to the §103 rejections with arguments regarding these claims, and she also requested that Applicants include an argument as to why crystallization is not inherent to the annealing process. In addition, Examiner Trinh asserted that there may be a §112 problem with respect to claims 33-35.

35 U.S.C. § 112 Issues

In response to concerns raised by the Examiner during the April 9 interview, Applicants have amended claim 33 to recite “wherein the bonding layers comprise at least one of amorphous (Ga,As) and polycrystalline (Ga,As) ...” to clarify that the selection is between an amorphous semiconductor including Ga and As and a polycrystalline semiconductor including Ga and As. Claims 34-35 and 135 have been amended similarly. In addition, Applicants have amended claims 46-47 and 114-115 to recite that one of the bonding layers comprises a polycrystalline semiconductor layer for consistency with the respective independent claims, which recite that at least one of the bonding layers comprises an amorphous material.

Rejections Under 35 U.S.C. § 103

In the Office action dated March 9, 2007, the Examiner asserted that claims 30-31, 33-43, 46-53, 78-80, 82, and 101-103, and 105-140 are unpatentable over Lee et al. (“Lee,” EP 1246238) in view of Malik et al. (“Malik,” US 6,881,644) under 35 U.S.C. §103(a). Applicants respectfully disagree. As discussed in detail in Applicants’ previous amendments, the references cited by the Examiner, either alone or in combination, do not teach or suggest each and every element of the claims.

Independent Claims 30, 102, and 132

Neither of the references cited by the Examiner teaches crystallizing at least a portion of the amorphous material of the bonding layers to a polycrystalline material during annealing, as recited by independent claims 30 and 102. Nor do the references teach crystallizing at least a portion of the amorphous material of the bonding layers to a polycrystalline material during the application of pressure to bond the first and second structures together, as recited by independent claim 132. Nowhere in Lee or Malik, including the sections of Malik to which the Examiner refers in her rejection (the abstract and col. 12, lines 40-50), is there any disclosure of crystallization of an amorphous material, much less the crystallization of an amorphous material to effect bonding.

In response to the Examiner’s request during the April 9 telephone interview, Applicants address the issue of inherency, which the Examiner originally raised during a telephone interview on November 20, 2006. Examiner Trinh has suggested that

crystallization of an amorphous material to a polycrystalline material is inherent during annealing. However, no facts or technical reasoning have been presented to support this assertion. In fact, one of the references cited by the Examiner provides evidence to the contrary. In paragraph [0021], Lee teaches: "the first material and the second material comprise amorphous compounds and the annealing step results in those compounds forming an amorphous compound bond layer that adhesively bonds the active substrates to the base substrate." According to Lee, the bonding of the two materials occurs during annealing without crystallization of an amorphous material to a polycrystalline material. The prior art clearly demonstrates that crystallization of an amorphous material is not a necessary consequence of annealing.

Referring to §2112 of the MPEP, the Board of Patent Appeals and Interferences has ruled that:

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)

Applicants therefore respectfully point out that the requirements of a rejection based on an inherency argument have not been met. The references cited by the Examiner, either alone or in combination, do not explicitly or inherently teach each and every element of the claims. Because the Examiner has not established a *prima facie* case of obviousness, the rejections under 35 U.S.C. § 103 of independent claims 30, 102 and 132, and all claims depending therefrom, should be withdrawn. For at least these reasons, Applicants respectfully submit that the pending claims are patentable.

Conclusions

Applicants respectfully submit that all of the pending claims are in condition for allowance. If for any reason the Examiner is unable to allow the application in the next Office action and believes that a telephone interview would be helpful to resolve any remaining issues, the Examiner is invited to contact the undersigned.

Respectfully submitted,

A handwritten signature in cursive script, reading "Mindy N. Rittner", is written over a horizontal line.

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